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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/546,622	08/22/2005	Tsugio Yokoo	4265-0063WOUS	4471

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EXAMINER	
DESAI, NAISHADH N	

ART UNIT	PAPER NUMBER
2834	

MAIL DATE	DELIVERY MODE
03/24/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/546,622	YOKOO ET AL.	
	Examiner	Art Unit	
	NAISHADH N. DESAI	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 January 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,5,9 and 10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,5,9 and 10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/13/2010 has been entered.

Specification

2. The disclosure is objected to because of the following informalities: in paragraph [0071] of applicant's USPGPub US 20060193683 A1, it states "...an acuter-angled triangle...". It is believed by examiner that applicant meant acute angled triangle.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1,4,5, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frey et al (US 2003/0136618) in view of Matsuoka (JP 6-080377).

3. Regarding claim 1, Frey et al teaches:

A shaft (Fig 1,12), used for an electric motor (Fig 1,10), to which a commutator (Fig 1,32) to be fitted having a fit hole is fitted / fixed (Fig 1 shows that the commutator 32 is fitted on the shaft 12, therefore the commutator 32 inherently has a hole), comprising:

four strips of knurls (see below re-illustration of Fig 4,knurls and Fig 5,66,68,88),

wherein each strip of knurls (see below re-illustration of Fig 4,knurls and Fig 5,66,68,88) is formed on an outer circumferential surface of the shaft (Fig 4,12) as to extend along an axial direction (Fig 5,66,68,88 also paragraph [00430]),

wherein the strips of knurls (see below re-illustration of Fig 4,knurls and Fig 5,66,68,88) are evenly spaced circumferentially about the shaft (Fig 4,12) as measured from a vertex of the acute-angled triangles of each knurl (see below re-illustration of Fig 4,knurls shows it having a triangular shape and a vertex).

wherein a pair of groove portions (see below re-illustration of Fig 4,grooves) is formed between a first adjacent pair of knurls (see below re-illustration of Fig 4,knurls) at each position substantially adjacent to those knurls (see below re-illustration of Fig 4,knurls) and another pair of groove portions (see below re-illustration of Fig 4,grooves) is formed between a second adjacent pair of knurls at each position substantially

adjacent to those knurls (re-illustration of Fig 4,knurl below shows that the grooves are formed adjacent to the knurls and the shaft having two pairs of knurls and grooves),

wherein the vertexes (see below re-illustration of Fig 4,knurls shows them having a vertex) protrude radially outward from the outer circumferential surface of the shaft (Fig 4,12) and the groove portions (see below re-illustration of Fig 4,grooves) sink radially inward from the outer circumferential surface of the shaft (Fig 4,12), and

wherein the outer circumferential surface of the shaft (see below re-illustration of Fig 4 shows the shaft 12 having an outer circumferential surface which is the space between the grooves) is placed between each pair of groove portions (see below re-illustration of Fig 4, grooves) and the first adjacent pair of knurls and the second adjacent pair of knurls (see below re-illustration of Fig 4, knurls)".

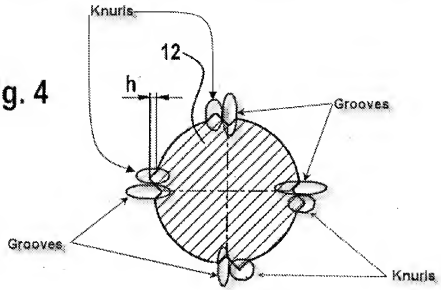
Frey et al do not explicitly teach that each strip of knurls is formed into an acute-angled triangle.

Matsuoka (Figs 4-6 elements 23,24 and Fig 12,6) teaches a device wherein "each strip of knurls is formed into an acute-angled triangle (Fig 5,24).
It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the knurls of Frey et al to have a specific shape like an acute-angled triangle and arrange them in a specific manner as taught by Matsuoka. The motivation to do so is that it would allow one to make a motor having simple construction, installation and compact dimensions (paragraph [0003] of Frey et al) and that it would allow one to improve the mounting strength of a part attached to the

revolving shaft of a rotor and reduce manufacturing time (paragraphs 6 and 7 of Matsuoka).

In case applicant disagrees with the above, Frey et al clearly teaches the use of knurls except for the shape of the each strip of knurls to be formed into an acute-angled triangle. It would have been an obvious matter of design choice to make each strip of knurls formed into an acute-angled triangle, since such a modification would have involved a mere change in the shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art. *In re Rose, 105 USPQ 237 (CCPA 1955)*. The motivation to do so would be that it would allow for simple construction, installation and compact dimensions (paragraph [0003] of Frey et al).

Fig. 4



4. Regarding claim 4, Frey et al teaches that axial-directional lengthwise dimensions of the knurls (Fig 1,70) are set longer than that of the commutator (Fig 1,32) to be fitted.

5. Regarding claim 9, Frey et al (see above re-illustration of Fig 4,knurls) teaches that each strip of knurls is spaced from each other with the outer circumferential surface of the shaft.

6. Regarding claims 5 and 10, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the

prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

While claim 1 is drawn to a shaft, the recited feature of "fit hole" in claims 5 and 10 is not part of the shaft but of the commutator in which the shaft is to be inserted. See the pre-amble for intended use of the claimed shaft with a commutator having the fit hole. Therefore the limitations "an inner diameter of the fit hole is set larger than an outer diameter of the shaft" (claim 5) and limitation "an inner surface of the fit hole elastically deform upon contact" (claim 10) have not been given patentable weight, since the commutator's inner diameter does not further limit the claimed shaft.

In any event, Examiner notes since Frey et al teaches that the commutator is fitted to the knurls (paragraph [0013]), it is capable of performing the intended use of "an inner diameter of the fit hole is set larger than an outer diameter of the shaft".

Regarding the shaft structure that is implied by claim 10, it is inherent Frey et al's shaft material (paragraph [0010] teaches the shaft material to be harder than Aluminum) is "elastically deformable" because "elastic" is a relative term, subject to broad interpretation.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Examiner notes that JP 06-245476 provided in applicant's IDS filed 08/22/2005 also teaches a shaft having knurls closely resembling applicant's instant invention.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NAISHADH N. DESAI whose telephone number is (571)270-3038. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Quyen Leung can be reached on (571) 272-8188. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Quyen Leung/
Supervisory Patent Examiner, Art Unit 2834

Naishadh N Desai
Patent Examiner